

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET (Pursuant to NAC 445.42525)

Permit Number: **UNEV89006T07**

Facility Name: **Grant Canyon Field**
Facility Address: **Grant Canyon Unit**
Railroad Valley
Nye County, NV

Permittee(s): **Grant Canyon Oil and Gas, LLC**
Permittee Address(es): **1801 Broadway, Suite 350,**
Denver, CO 80202

Property Owner: **Bureau of Land Management**

Legal Description: **IW #1: Section 21, T7N, R57E, MDB&M Nye County, Nevada**
IW #3: Section 16, T7S , R57E, MDB&M Nye County, NV

Number of Permitted Wells: **Two injection wells: IW-1 (produced water) and IW-3 (ambient air)**

Other Permitted Discharges: **N/A**

Reporting Frequency: **Quarterly**

A. Description of Discharge

Location: Injection well Grant Canyon #1 located in Section 21, T7N, R57E, Nye County, Nevada.

Characteristics: All injectate into Grant Canyon #1 is fluid produced in conjunction with conventional oil production. The injectate fluid will have a TDS concentration of approximately 5000 ppm and will contain hydrocarbons.

Location: Injection well Grant Canyon #3 located in Section 16, T7N, R57E, Nye County Nevada.

Characteristics: All injectate into Grant Canyon #3 is ambient air to enhance recovery related to conventional oil production.

B. Synopsis

UNEV89006 was originally issued in 1989 to permit injection into Grant Canyon #1. UNEV89006 was renewed in 1994 and 1999. In 2007, the applicant requested permission to modify UNEV89006 to include injection of ambient air for the enhanced recovery of oil in conventional oil production into Grant Canyon well #3. UNEV89006T07 is being issued to supercede UNEV89006 to add ambient air injection into Grant Canyon #3 and will expire upon

subsequent renewal of UNEV89006. This fact sheet is intended to provide information on UNEV89006T07 and the renewed version of UNEV89006. The only wells known to exist within the area of review are associated with oil production.

Grant Canyon well #1 will receive injectate fluids produced in conjunction with conventional oil production activities from other wells in the area. The average injection rate will be approximately 20,000 barrels water (1 barrel = 42 gals.) per day. The maximum pressure allowed at the wellhead will be 1,300 psig.

Grant Canyon well #3 will receive compressed ambient air in order to replace the approximately twenty million barrels of oil which has been removed from the reservoir during twenty-two years of production. This air injection is intended to provide reservoir pressures to allow the Grant Canyon Unit production wells to flow freely. The maximum pressure allowed at the wellhead will be 1,600 psig and the maximum injection rate shall not exceed 1200 cubic feet per minute (cfm).

C. Receiving Water Characteristics

The injection zone is within the Devonian Guilmette formation. This zone has been characterized by water analysis and by other wells in the area to be high in total dissolved solids and to contain hydrocarbons. An impermeable clay zone has been identified between the valley fill and the lower Paleozoic Carbonates. A water quality analysis of the receiving zone indicates the receiving formation has the following general characteristics: TDS 3490 mg/L, Sodium 1340 mg/L, Calcium 63.3 mg/L, Sulfates 420 mg/L, Chloride 1100 mg/L and Bicarbonate 1232 mg/L.

D. Procedures for Public Comment

The Notice of the Division's intent to reissue a permit authorizing the facility to discharge to the ground water of the State of Nevada, is being sent to the Ely Daily Times for publication. The notice is being mailed to interested persons on our mailing list (see Attachment A). Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the public notice. The comment period can be extended at the discretion of the Administrator. All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected state, any affected interstate agency, the regional administrator, EPA Region IX or any interested agency, person or group of persons.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings will be conducted in accordance with NAC 445.150.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445.274.

E. Proposed Determination

The Division has made the tentative determination to issue UNEV89006T07 adding ambient air injection to Grant Canyon #3 and to subsequently reissue the permit UNEV89006.

F. Proposed Injection Limitations and Special Conditions

Injectate into Grant Canyon #1 will be monitored annually for the following parameters listed in Table 1:

Table 1: Required Sampling

PARAMETER	LOCATION(S)	FREQUENCY	LIMITATIONS
Arsenic, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Boron, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Electrical Conductivity, μ mhos/cm	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Fluoride, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
pH, standard units	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Total Dissolved Solids, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Antimony, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Barium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Bicarbonate, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Cadmium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Calcium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Chloride, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Chromium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Copper, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Iron, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Lead, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Lithium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Magnesium	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Manganese, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Mercury, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Nitrate as N, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Potassium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Selenium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Silica, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Silver, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report

Sodium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Sulfate, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Strontium, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Total Petroleum Hydrocarbons, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report
Zinc, mg/L	Monitoring location in I.C.1	Annually, taken in October	Monitor and Report

Additionally, both Grant Canyon well #1 and #3 will be monitored as follows, with the results submitted in quarterly reports to the Division:

1. For each month in the reporting period, the **total volume produced** for each well (in gal/month) and the **mean, lowest and highest production rate** reported in gpm.
2. For each month in the reporting period, the **total volume of fluid injected** and the **mean, lowest and highest injection rate**.
3. For each month in the reporting period, **the mean, lowest and highest injection pressure** reported in psig.
4. For each month in the reporting period the **average injection temperature** for Grant Canyon well #1 reported in degrees Fahrenheit (°F).
5. Summary narrative analysis of monitoring activities for that six (6) month period. The narrative shall include, but not be limited to, any problems encountered that had or have the potential to have affected the well integrity or the water quality, any spills or releases at the site, the type of action taken, and all tests performed on the wells within the project area.
6. A list of all chemical additives used, including but not limited to, scale and corrosion inhibitors, biocide, etc, which were used during the six (6) month period. **Include product name, introduction rate, total amount/volume used during the reporting period, and amount of chemical currently stored on-site.**
7. The UIC Monitoring Report Summary and Check List form attached to this permit (submit with every report.)
8. Annually, submit a list of all production, injection, observation, and test wells located within the project area and utilized by the Permittee or his/her affiliates. The list shall be chronological, listing the newest wells first, and shall include date of installation, depth, type of well, status (abandoned, plugged, not-in-use, etc.), well identification and location.

G. Rationale for Permit Requirements

Permit requirements will verify that the quality of fluid discharged to the injection well remains constant and will confirm that fluids disposal does not adversely affect the existing hydrologic regime.

Prepared by: Birgit M. Widegren
Bureau of Water Pollution Control

Date: March 20, 2007